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CIVIL & ENVIRONMENTAL
ENGINEERING, SURVEYING

August 11, 2015

Wisconsin Department of Natural Resources
Attn: Greer Lundquist
107 Sutliff Avenue
Rhinelander, WI 54501

Subject:

Soil Investigation Proposal (amended)
Tower Standard Service
14267 State Highway 70 W
Lac du Flambeau, WI 54538
BRRTS: 03-64-127899
PECFA: 54538-9517-67

Dear Greer,

REI Engineering, Inc. is hereby submitting the amended Soil Investigation Proposal for the above referenced site. The report was amended at the request of the Wisconsin Department of Natural Resources following the initial review of the June 2015 Soil Investigation Proposal.

If you have any comments, please contact our office at (715) 675-9784 or electronically at dlarsen@reiengineering.com.

Sincerely,
REI Engineering, Inc.

David Larsen, P.G.
Hydrogeologist / Project Manager

cc: William Kozak, 8760 W Squaw Lake Road, Lac du Flambeau, WI 54538

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CIVIL & ENVIRONMENTAL
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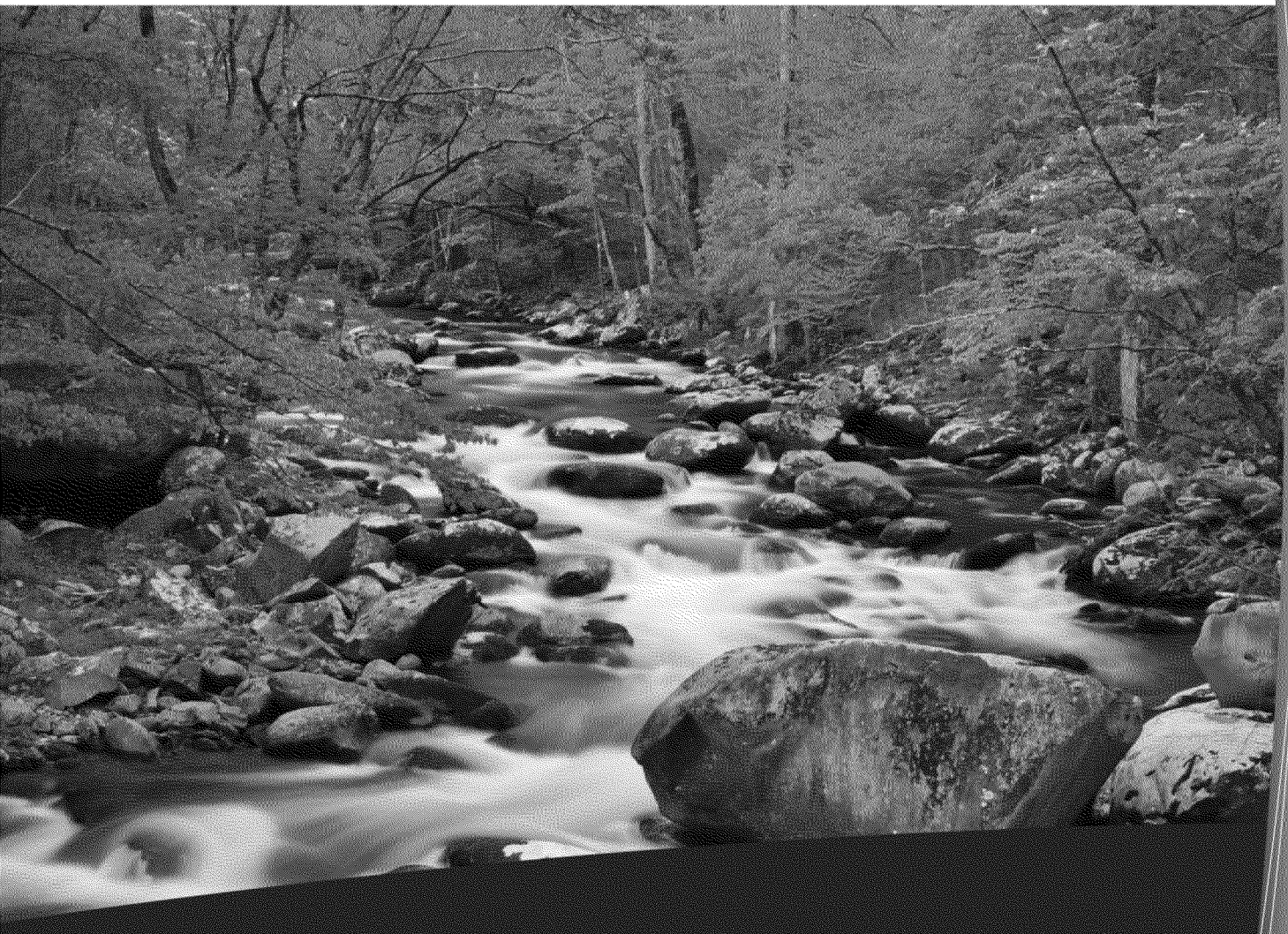
SOIL INVESTIGATION PROPOSAL (AMENDED)

TOWER STANDARD SERVICE
14267 STATE HIGHWAY 70 W
LAC DU FLAMBEAU, WI

REI PROJECT #903



COMPREHENSIVE SERVICES WITH PRACTICAL SOLUTIONS

SOIL INVESTIGATION PROPOSAL (AMENDED)

TOWER STANDARD SERVICE
14267 STATE HIGHWAY 70 W
LAC DU FLAMBEAU, WI

BRRTS #03-64-127899
PECFA #54538-9517-67

REI #903

PREPARED FOR:

Mr. William Kozak
8760 W Squaw Lake Road
Lac du Flambeau, WI 54538

AUGUST 2015

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TOWER STANDARD SERVICE
14267 STATE HIGHWAY 70 W
LAC DU FLAMBEAU, WI

BRRTS #03-64-127899
PECFA #54538-9517-67

REI #903

1.0 INTRODUCTION

REI Engineering, Inc. (REI) has prepared an amended Soil Investigation Proposal to conduct Site Investigation activities at the former Tower Standard Service located at 14267 State Highway 70 W, Lac du Flambeau, WI. (Figure B.1.a). The purpose of the site investigation is to advance soil borings on the subject and adjoining properties with the intention of the collection of soil samples for laboratory analysis, in an attempt to determine the degree and extent of the known release.

The Tower Standard site had previously been investigated for a petroleum release. The Wisconsin Department of Natural Resources (WDNR) was notified of the contamination on May 7, 1997 and the investigation was officially closed in 2006. The investigation and remediation included the advancement of fifteen (15) Geoprobes, eighteen (18) environmental wells, four (4) extraction wells, limited soil excavation, operation of a groundwater extraction and treatment system and replacement potable water supply well.

The Tower Standard Service investigation was re-opened by the WDNR in 2015 after it was determined that elevated petroleum related groundwater concentrations were identified in a subsequent investigation. The subsequent investigation was prompted by the Lac du Flambeau Band of Lake Superior Chippewa Indians following the October 2006 structural fire at 14258 Hwy 70 W. The building housed a fireworks stand, pawn shop and auto repair shop at the time of the fire. A significant volume of

water was used to suppress the fire and there was concern over the potential impact to the neighboring private potable water supply wells.

An investigation into the degree and extent of possible perchlorate contamination was initiated under the Targeted Brownfields Assessment (TBA) program under the direction of the United States Environmental Protection Program (U.S. EPA) in response to concerns from the Lac du Flambeau Band of Lake Superior Chippewa Indians. This investigation began in 2007 and was concluded in 2014. During the TBA investigation groundwater samples were collected and analyzed for volatile organic compounds (VOC's) and it was determined that elevated petroleum related groundwater were identified in the area of the Tower Standard residual groundwater contaminant plume. The concentrations identified under the TBA investigation were higher than the concentrations identified at the time of closure for the Tower Standard investigation. This inconsistency resulted in the re-opening of the Tower Standard Service investigation in 2015.

REI Engineering, Inc. (REI) has been retained to complete the investigation into the 2015 re-opened Tower Standard Service site. The intent of the investigation is to complete a stepped approach to the identification of the petroleum contamination following the 2006 closure approval at the Tower Standard Service site. T he investigation will initially focus on attempting to identify a soil source for the reported groundwater contamination. Potential sources of petroleum contamination are identified in later sections of this document. Subsequent field work will focus on identifying the degree and extent of the groundwater contaminant plume.

2.0 BACKGROUND INFORMATION AND SCOPE OF WORK

2.1 Responsible Party

Tower Standard Service
Attn: Mr. William Kozak
8760 W Squaw Lake Road
Lac du Flambeau, Wisconsin 54538

2.2 Consultant

REI Engineering, Inc.

4080 North 20th Avenue

Wausau, Wisconsin 54401

Phone (715) 675-9784

2.3 Site Name, Address, and Location

Site Name: Tower Standard Service

Site Address: 14267 Highway 70 W
Lac du Flambeau, WI 54538

Site Location: SE ¼ of the SW ¼ of Section 30, Township 40 North, Range 5 East, in the Town of Lac du Flambeau, Vilas County, Wisconsin (Figure B.1.a)

2.4 Past and Present Land Use

The subject Property currently operates as a bait and tackle and automotive repair shop. There were six (6) known Underground Storage Tanks (USTs) associated with this property. Tank sizes, contents and status are presented below.

Tank No.	Tank Size (gal)	Tank Contents	Tank ID Number	Status
1	1,000	Unleaded Gasoline	355389	Closed/Removed 10/1/1997
2	1,000	Unleaded Gasoline	355390	Closed/Removed 10/1/1997
3	300	Waste Oil	355386	Closed/Removed 10/1/1997
4	500	Waste Oil	355505	Closed/Removed 10/1/1997
5	300	Leaded Gasoline	355387	Closed/Removed 10/1/1997
6	6,000	Unleaded Gasoline	355388	Closed/Removed 10/1/1997

2.5 Other Sources of Contamination

2.5.1 Yeschek's – The Tower

The Tower was built in 1929 and included a bar, restaurant, garage, store and retail fuel sales. The Tower was located on the north eastern intersection corner of State Highway 70 and County Highway D (Figure B.1.b). The Tower operated from 1929 until it was lost to a fire in February 1958. The Tower Standard Service (14267 Hwy 70 W) replaced the gas station and garage at The Tower and the Timberland Tower Restaurant (14257 State Highway 70 W) was built to replace the restaurant at The Tower. Figures B.1.b and B.1.c are aerial photoset from 1948 that includes the location of Yesheck 's – The Tower and the former alignment of the Highway 70 / County Road D intersection. The 1948 photosets include overlays of current investigation points of interest. This should aid in placement of borings to determine if Yesheck's – The Tower or other historic property uses could be a potential contributing source to the groundwater contaminant plume. Figures B.1.d and B.1.e are photosets utilizing the 2010 aerial photo of the subject area. Figures B.1.d and B.1.e include the same overlays as the 1948 photosets.

2.5.2 Former Yeschek/Timberland Tower Restaurant

The Former Yeschek/Timberland Tower Restaurant (14257 State Highway 70 W) was located directly east of the Tower Standard site (Figure B.1.b). Petroleum contamination was reported to the WDNR on September 19, 1994 (BRRT's 03-64-001172). Drake Environmental was retained to conduct an environmental site investigation. Based on the records from the Soil Remediation and Groundwater Monitoring Documentation Report (Drake, 1996), significant odors in the basement of the restaurant following a heavy rain episode in June of 1994, prompted the investigation. Subsequently, it has been determined that the odors detected in the basement of the former Timberline Tower Restaurant were fuel oil and not gasoline related. The restaurant had a 1,000 gallon fuel oil tank located in the basement and a 550 gallon fuel oil tank located at the southeast corner of the building. Contamination associated with the fuel oil tanks was mainly restricted to the soil, with trace contamination observed in the groundwater.

2.5.3 Former Tower Motel

The former Tower Motel, currently operated as the Haskell Lake Lodge, is located directly southwest of the Tower Standard site (Figure B.1.b). Petroleum contamination was reported to the WDNR on August 21, 1992 (BRRT's 03-64-000821). Petroleum was reported in the drinking water well of the motel. A replacement potable water supply well (#2) was drilled to thirty-one (31) feet at the southeast corner of the motel and was also impacted by the petroleum impacted groundwater and was abandoned. A third potable wel l (#3) was drilled to a depth of seventy-five (75) feet bls, which corresponded to encounter of bedrock, near the location of the second well (Figure B.1.b). Petroleum compounds subsequently impacted the third well shortly after it was installed and it was also abandoned. A final replacement well was drilled near State Highway 70, northeast of the Motel, to the encounter of bedrock at approximately forty-three (43) feet bls. This is the potable well that currently services the Haskell Lake Lodge.

The fuel oil tanks servicing the Tower Motel were removed prior to 1998. A BRRT's listing of 09-64-295455 corresponds to the Tower Inn, no address listed on State Highway 70 W and states that two (2) fuel oil underground storage tanks (500 and 1,000 gallon UST's) were removed in 1994. There is a note that there were twenty (20) holes in the tank, but DRO samples were non-detect. No known additional environmental work has been conducted on the property.

2.5.4 Grizzly Bill's

Grizzly Bill's (1420 State Highway 70 W) is located approximately seven hundred (700) feet northeast of the Tower Standard site (Figure B.1.b and Figure B.1.d). Based on underground storage tank registration records, four (4) UST's were located on the site, one 10,000 gallon leaded, one 55 0 gallon leaded, 10,000 gallon unleaded and a 550 gallon premix tank. Soil contamination was reported to the DNR in 1992 (BRRT's 03 -64-000754). Grizzly Bill's retained Fluid Management, as the Environmental Consultant for

the investigation into the fuel related release. According to Fluid Management's closure petition all petroleum related contamination was confined to the soil, and approximately four hundred (400) cubic yards of petroleum impacted soil was excavated in 1994. The site investigation was officially closed in 1995. Grizzly Bill's continued to dispense petroleum products commercially until September 1997, when all UST's were removed. No petroleum contamination was reported during the tank removal site assessment (BRRT's 09-64-293874).

REI will continue to investigate the possibility that any of the known other sources of contamination may be contributing to the contamination identified at the Tower Standard Service investigation.

2.6 Potential Impact to Receptors

REI will investigate and evaluate the potential impact to receptors during the site investigation. Specifically, REI will determine the locations of potable wells, potential for contamination of other surface waters, and potential vapor intrusion into structures.

2.7 Potable Water Survey

REI will conduct a well records search for locations of any existing nearby potable wells. All properties in the immediate area are supplied by private potable water wells. Results of this search will be included in a subsequent report.

2.8 Scope of Work

This initial proposed scope of services is specific to soil contamination only. Subsequent scope of work will investigate the degree and extent of the petroleum impact to groundwater at this site. REI recommends that the following workscope be completed to define the vertical and horizontal extent of soil contamination at the site. The specific work scope is as follows:

1. Mobilize to the site to oversee the advancement of thirty-five (35) proposed soil borings and an additional twelve (12) optional borings whose locations will be determined during the completion of the proposed scope of work. The proposed soil boring locations are as follows:
    - Soil borings will primarily be placed in the area of the former underground storage tank basin and former petroleum system dispenser location of the former Tower Standard gas station. The intent is to attempt to determine the extent of any residual petroleum impacted soil following the 2006 case closure.
    - Additional soil boring locations include the north east intersection right-of-way, immediately south of the former Yeshecks – The Tower gas station. The intent in these locations is to determine if the former Yeshecks – The Tower gas station could be a contributing source of petroleum contamination.
    - Proposed soil borings adjacent to the man-made pond. Local knowledge has it that the location of the pond was once a dumping ground. Prior to the construction of the Timberland Tower restaurant, a large hill was bulldozed to level off the property and that fill was used to cover the former dump.
    - Boring placement east of the former Tower Standard tank bed to aid in defining the impact near VAS08 (completed for Weston Solutions).

The borings will be advanced to depths ranging from twelve (12) feet t o approximately thirty-two (32) feet. Depth to groundwater at the site is approximately nine (9) feet below land surface. Additional borings may be required in the process of defining the degree and extent of previously identified contamination. The property boundaries, location of the structure and former USTs, and the proposed soil boring locations are depicted on the Figure B.1.b to B.1.e site maps. REI will field screen soil samples using a Photoionization detector (PID) to detect the presence of organic vapors in the soil. REI will also need to secure an access agreement with the off-site property owners before initiating any field work.

2. REI proposes to collect a minimum of two (2) soil samples from each boring. One sample will be collected from within four (4) feet of the surface to evaluate direct contact risks, unless PID readings indicate the sample is not impacted. The second sample will be collected from the highest PID field screen reading or the sample directly above the groundwater. Samples will be submitted for laboratory analysis of Petroleum Volatile Organic Compounds (PVOCs) , and naphthalene. Samples collected below the water table will be fields screened with the PID and visually logged to determine potential petroleum impact and soil characteristics.

3. REI will also collect two (2) soil samples for physical soil characterization. This will include analysis for bulk density, particle size by hydrometer and percent organic matter.

4. REI will also collect groundwater samples from select soil borings that encounter groundwater. Samples will be submitted for laboratory analysis of Petroleum Volatile Organic Compounds (PVOCs) and naphthalene.

5. All soil cuttings will be containerized in DOT certified 55-gallon drums and left on site pending final disposal at a licensed facility. All boreholes will be properly abandoned following the completion of the proposed work.

6. Upon completion of the fieldwork, REI will prepare a brief letter report. The report will include a figure identifying the locations of the soil samples, tabulated data, photographs, and laboratory analytical reports. Results of the site work will determine the need (if any) for additional site investigation work or if case closure is possible. REI will also complete required semi-annual update reporting.

3.0 Topographical, Geological, and Hydrologic Conditions

The property is located in the Upper Wisconsin River Basin. Site specific soil and geologic conditions, prominent topographic features, significant hydrologic features and surface water drainage patterns will be documented during the site investigation. The topography in the immediate area is rolling and slopes towards Lake Haskell. Topography in the surrounding area consists of rolling hills and pitted outwash deposits of sand or gravel, with many glacially derived lakes and streams.

4.0 Methodologies

4.1 Geoprobe

4.1.1 Soil Sampling

The Geoprobe unit hydraulically advances threaded, two-inch diameter, four-foot long, steel rod sections into the subsurface. A four-foot sampler, consisting of a drive shoe, a steel tube with a clean acetate liner, and a drive-head retractable piston, is attached to the leading Geoprobe rod. The sampler is driven down to the top of the interval to be sampled. The stop-pin is removed to release the drive head piston, which retracts as the sampler is advanced. When the sampler has been advanced four feet, the rods are retracted from the hole and the soil in the acetate liner is recovered. The acetate liner is split open and the soil is visually and manually classified by the field geologist/technician in accordance with **ASTM:D2488-84**. Logs of the borings are filled out indicating the depth and identification of the various strata, water level information, and pertinent information regarding the method of maintaining and advancing the borings.

Immediately after identification, the soil is quickly divided into two portions. One portion is prepared for potential laboratory analysis. The other portion is placed into a clean one-quart Ziploc bag for field screening. See the section "Soil Headspace Analysis" for field screening procedures.

4.2 Headspace Analysis

The soils will be screened with a photoionization detector (PID) equipped with a 10.6 eV lamp. The detector will be calibrated in instrument units for Total Organic Vapors using an isobutylene standard. The soil sample, sealed in a Ziploc bag, will be shaken vigorously to promote volatilization of the contaminant into the headspace of the bag. The sample will be allowed to rest for at least ten minutes and then shaken again before screening. When ambient temperatures are below 60 degrees F, soil samples are allowed to warm for a minimum of ten (10) minutes in a heated environment prior to headspace development. The Ziploc bag will be punctured with the PID probe and the resulting meter reading will be recorded.

4.3 Quality Assurance/Quality Control (QA/QC)

REI personnel will maintain strict adherence to established QA/QC procedures during sample collection and handling. EPA and/or WDNR standard accepted sample collection, transportation and storage protocols will be implemented prior to analysis of samples by a state certified laboratory. Sample containers will be properly preserved and stored prior to analysis. Dates of analysis, contingent upon the shelf life of the parameter of interest, will be noted. Field chain-of-custody (COC) documentation will be maintained for each sample. Internal laboratory QA/QC protocols will be adhered to in accordance with protocols outlined in EPA document SW846, Test Methods for Evaluating Solid Waste, EPA Method 8021 WDNR Petroleum Volatile Organic Compounds and naphthalene and EPA method 6020/200.8 Total Lead (Pb).

4.3.1 Chain of Custody

Upon completion of a soil, groundwater or vapor sample, a chain of custody log will be initiated. The chain of custody record will include the following information: project name, work order number, shipped by, shipped to, sampling point, location, field ID number, date and time taken, sample type, number of containers, analysis required, sampler(s) signature(s), etc. The fewest number of people possible will handle the samples.

4.3.2 Decontamination

Decontamination of all field equipment will be performed to eliminate potential cross-mixing between discrete sampling points. All sampling equipment will be decontaminated by washing with an Alconox/distilled water solution, rinsing with distilled water and triple rinsing with deionized water. All drilling equipment including augers, tools, and split spoons will be decontaminated using a high pressure steam cleaner. Wash water will be contained on-site in Wisconsin Department of Transportation (WDOT) approved 55-gallon drums pending proper disposal or treatment.

5.0 CHEMICAL ANALYSIS OF SOILS

Soil samples collected will be submitted to a state certified laboratory for analysis of appropriate constituents. Laboratory analysis of the collected soil samples will be completed in accordance with EPA and/or WDNR accepted methods. The soil sample in the upper four (4) feet and the sample exhibiting the highest PID reading from each boring will be analyzed according to one or more of the following methodologies:

EPA Method	Analytical Constituent	Method Detection Limit
8021	Petroleum Volatile Organic Compounds and Naphthalene	0.002387-0.007161 mg/kg
ASTM4531	Bulk Density	
ASTM D422	Particle Size by Hydrometer	
ASTMD2974	Percent Organic Matter	

ug/kg = parts per billion (ppb)
mg/kg = parts per million (ppm)

All soil sample data collected from field screening and laboratory analytical sampling will be tabulated and summarized in the subsequent report. Laboratory analytical results will be compared to enforceable limits specific to each compound.

6.0 CHEMICAL ANALYSIS OF GROUNDWATER

Groundwater samples will be collected from each monitoring well and will be sent to the laboratory for analysis of appropriate constituents. Samples will be collected in

laboratory prepared vials and jars, placed into an iced cooler and transported to a state certified laboratory for one or more of the following analysis:

EPA Method	Analytical Constituent	Method Detection Limit
8021	Petroleum Volatile Organic Compounds and Naphthalene	0.322-1.029 ug/L

ug/L = ppb

7.0 REPORTING

At the conclusion of the field investigation, REI will analyze the data collected and prepare a written report of the findings. Measurements that are taken in the field will be utilized to prepare a scaled map of the subject site. Laboratory reports for both soil and groundwater samples collected during the investigation will be utilized to determine the extent of contamination. All data will be summarized into data tables. All soil samples collected will be classified and logged on the Wisconsin Department of Natural Resources Soil Boring Log Information Form 4400-122. The report that follows the investigative work will provide documentation of all work performed for the project and will include recommendations as to whether or not additional delineation of contaminants of concern or completion of a Remedial Action Plan is warranted.

8.0 PROJECT SCHEDULE

Once the Site Investigation Proposal has been approved by all parties the project will proceed according to the following schedule. The project schedule may be altered accordingly should additional work be required beyond the scope of work outlined in the Work Plan:

TASK DESCRIPTION	Time in Weeks								
	1	2	3	4	5	6	7	8	9
1. Approval of Work Plan	*								
2. Field Work									
3. Lab Analysis									
4. Data Interpretation & Draft									
5. Client Review									
6. Final Report									

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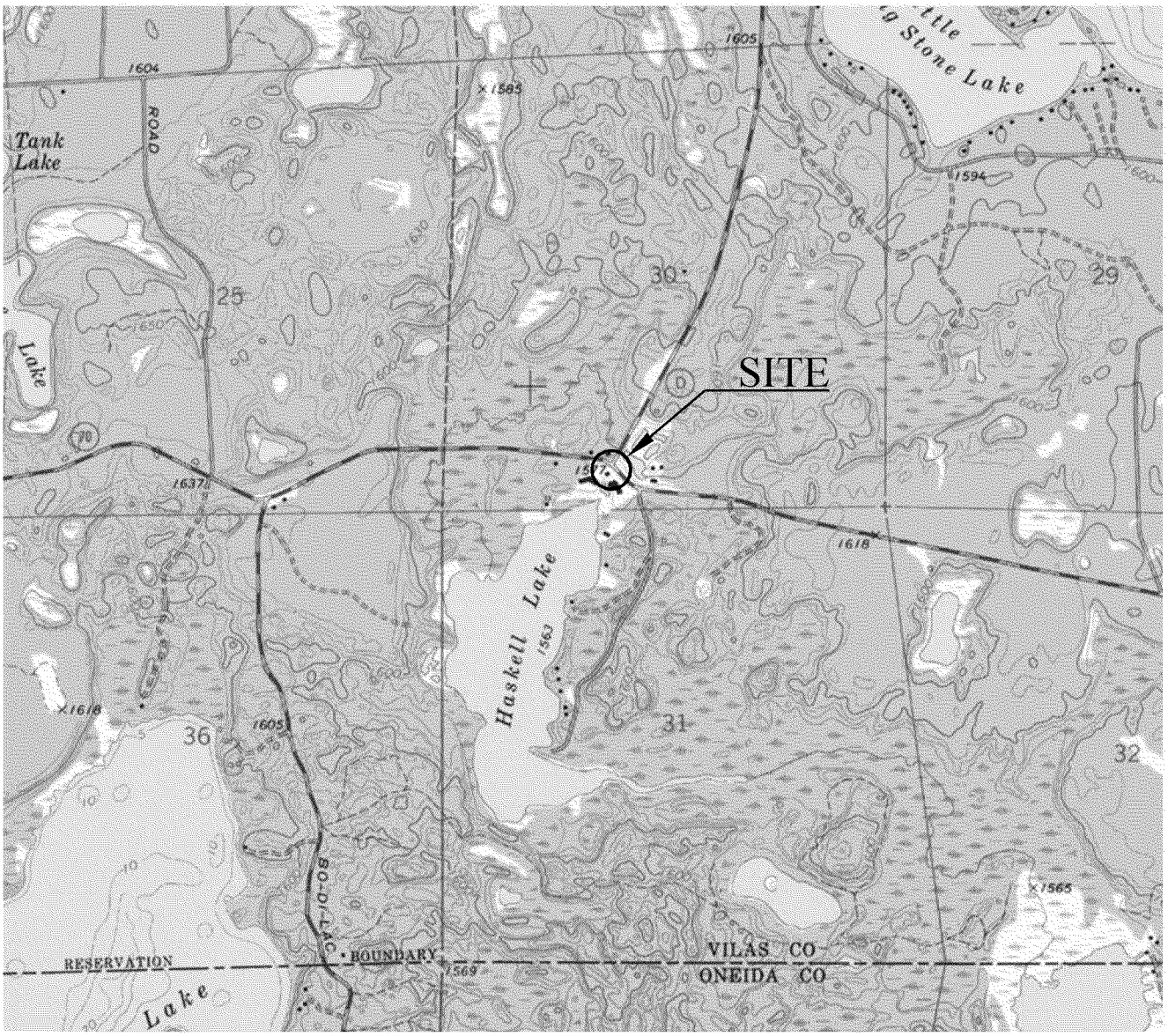


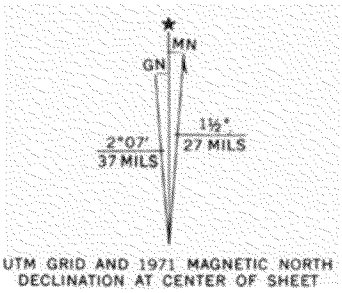
SCALE 1:24 000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929



UTM GRID AND 1971 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

LAC DU FLAMBEAU, WIS.

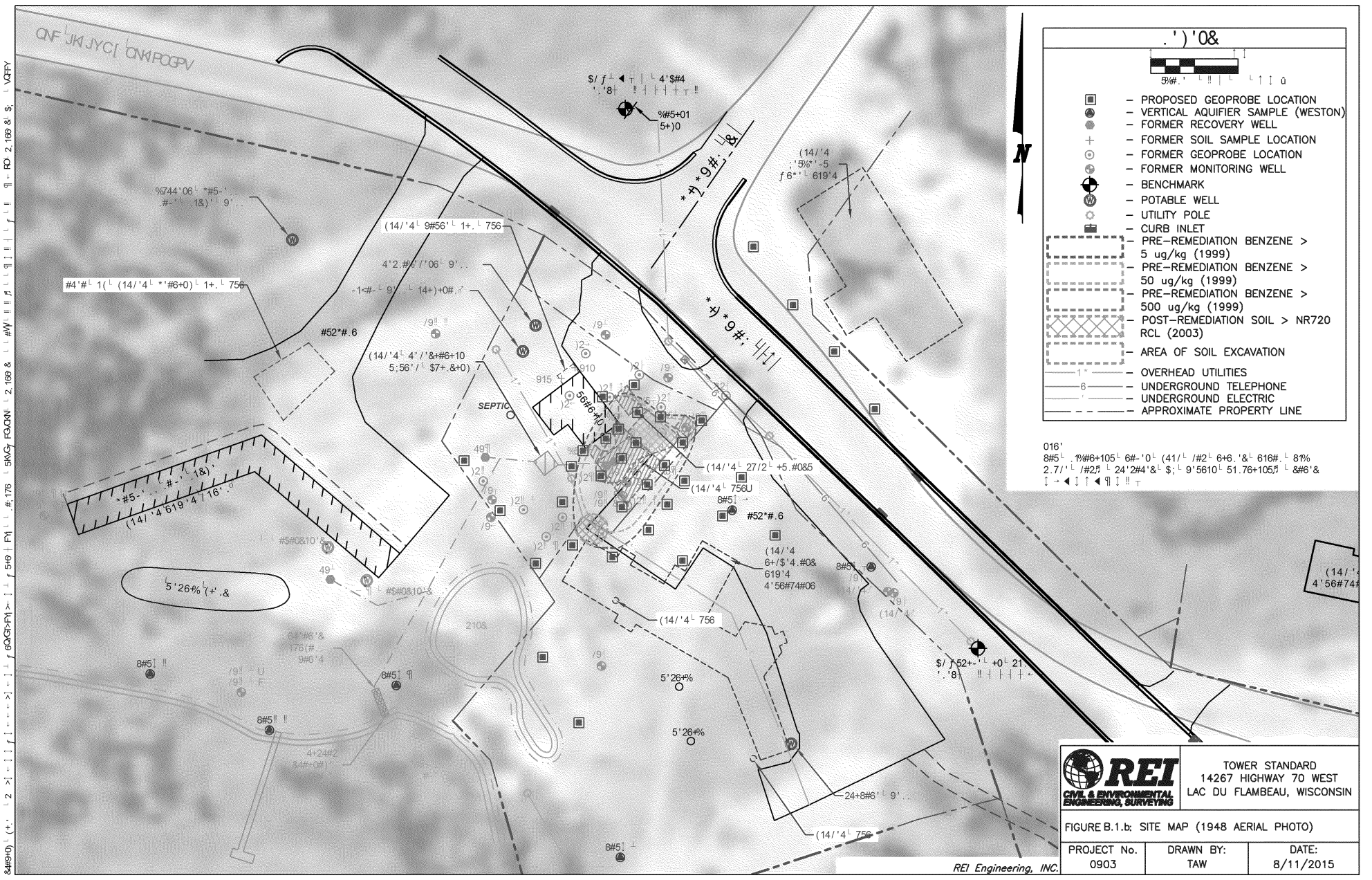
N4552.5—W8952.5/7.5

1971

AMS 3075 IV NW—SERIES V861

QUADRANGLE LOCATION

TOWER STANDARD HIGHWAY "70" LAC DU FLAMBEAU, WISCONSIN	FIGURE B.1.a: SITE LOCATION MAP		
	PROJECT NO. #0903	DRAWN BY: TAW	DATE: 06/23/15



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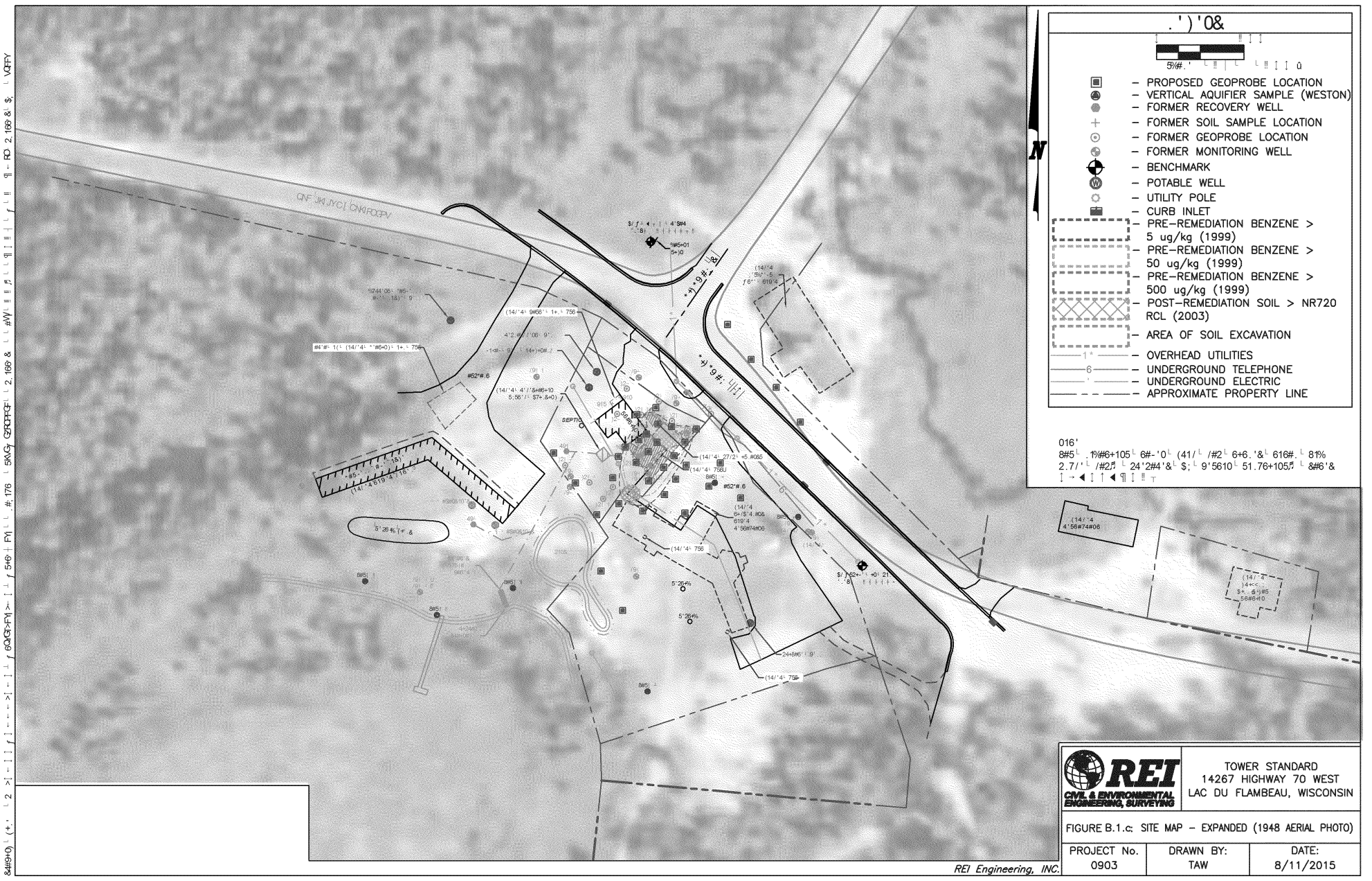
TOWER STANDARD
14267 HIGHWAY 70 WEST
LAC DU FLAMBEAU, WISCONSIN

FIGURE B.1.b: SITE MAP (1948 AERIAL PHOTO)

PROJECT No.	DRAWN BY:	DATE:
0903	TAW	8/11/2015


– PROPOSED GEOPROBE LOCATION
– VERTICAL AQUIFIER SAMPLE (WESTON)
– FORMER RECOVERY WELL
– FORMER SOIL SAMPLE LOCATION
– FORMER GEOPROBE LOCATION
– FORMER MONITORING WELL
– BENCHMARK
– POTABLE WELL
– UTILITY POLE
– CURB INLET
– PRE–REMEDIATION BENZENE > 5 ug/kg (1999)
– PRE–REMEDIATION BENZENE > 50 ug/kg (1999)
– PRE–REMEDIATION BENZENE > 500 ug/kg (1999)
– POST–REMEDIATION SOIL > NR720 RCL (2003)
– AREA OF SOIL EXCAVATION
– OVERHEAD UTILITIES
– UNDERGROUND TELEPHONE
– UNDERGROUND ELECTRIC
– APPROXIMATE PROPERTY LINE
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14267 HIGHWAY 70 WEST
LAC DU FLAMBEAU, WISCONSIN
FIGURE B.1.c: SITE MAP – EXPANDED (1948 AERIAL PHOTO)
PROJECT No. 0903
DRAWN BY: TAW
DATE: 8/11/2015
REI Engineering, INC.

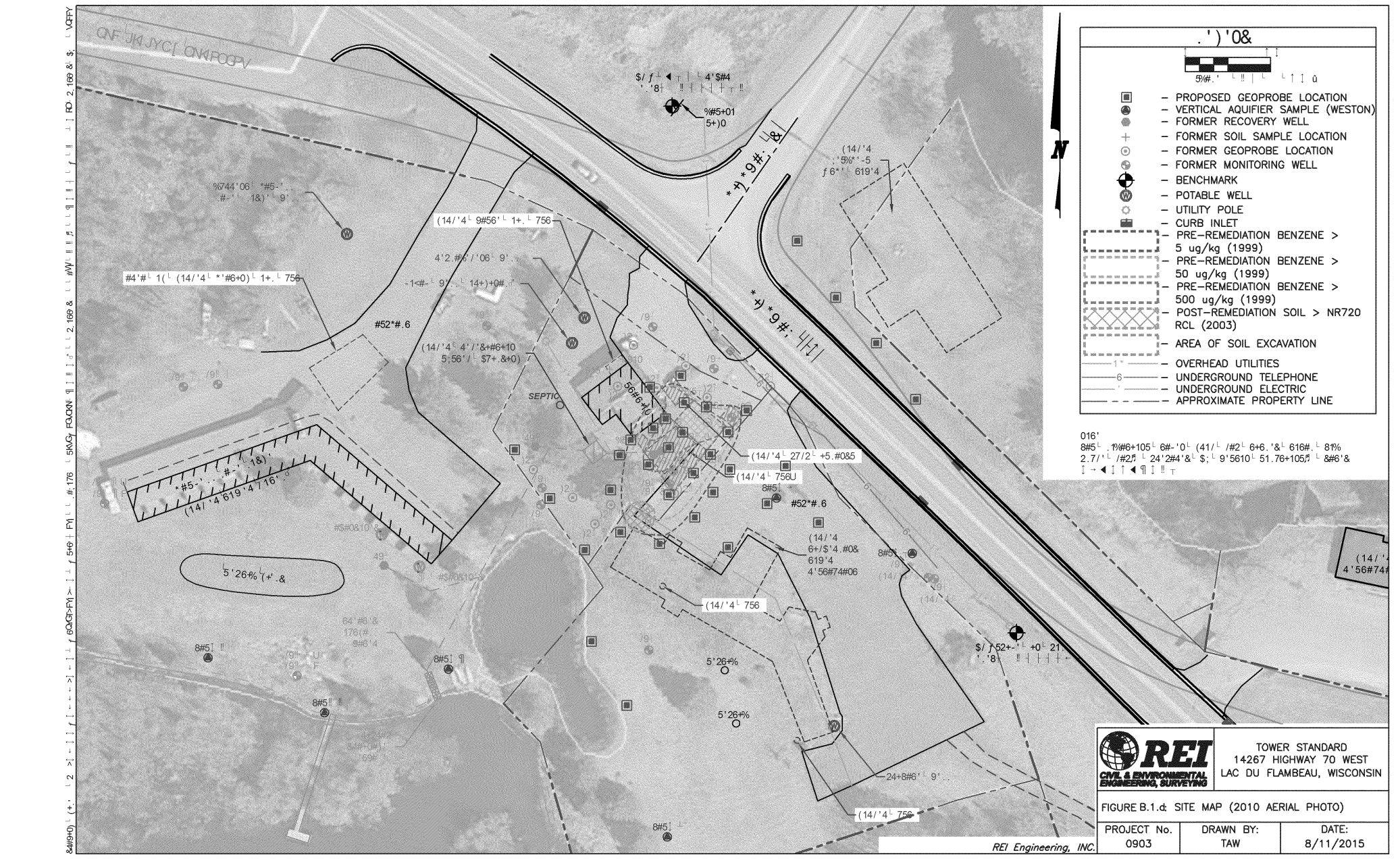
N
PROPOSED GEOPROBE LOCATION
VERTICAL AQUIFIER SAMPLE (WESTON)
FORMER RECOVERY WELL
FORMER SOIL SAMPLE LOCATION
FORMER GEOPROBE LOCATION
FORMER MONITORING WELL
BENCHMARK
POTABLE WELL
UTILITY POLE
CURB INLET
PRE-REMEDIATION BENZENE > 5 ug/kg (1999)
PRE-REMEDIATION BENZENE > 50 ug/kg (1999)
PRE-REMEDIATION BENZENE > 500 ug/kg (1999)
POST-REMEDIATION SOIL > NR720 RCL (2003)
AREA OF SOIL EXCAVATION
OVERHEAD UTILITIES
UNDERGROUND TELEPHONE
UNDERGROUND ELECTRIC
APPROXIMATE PROPERTY LINE
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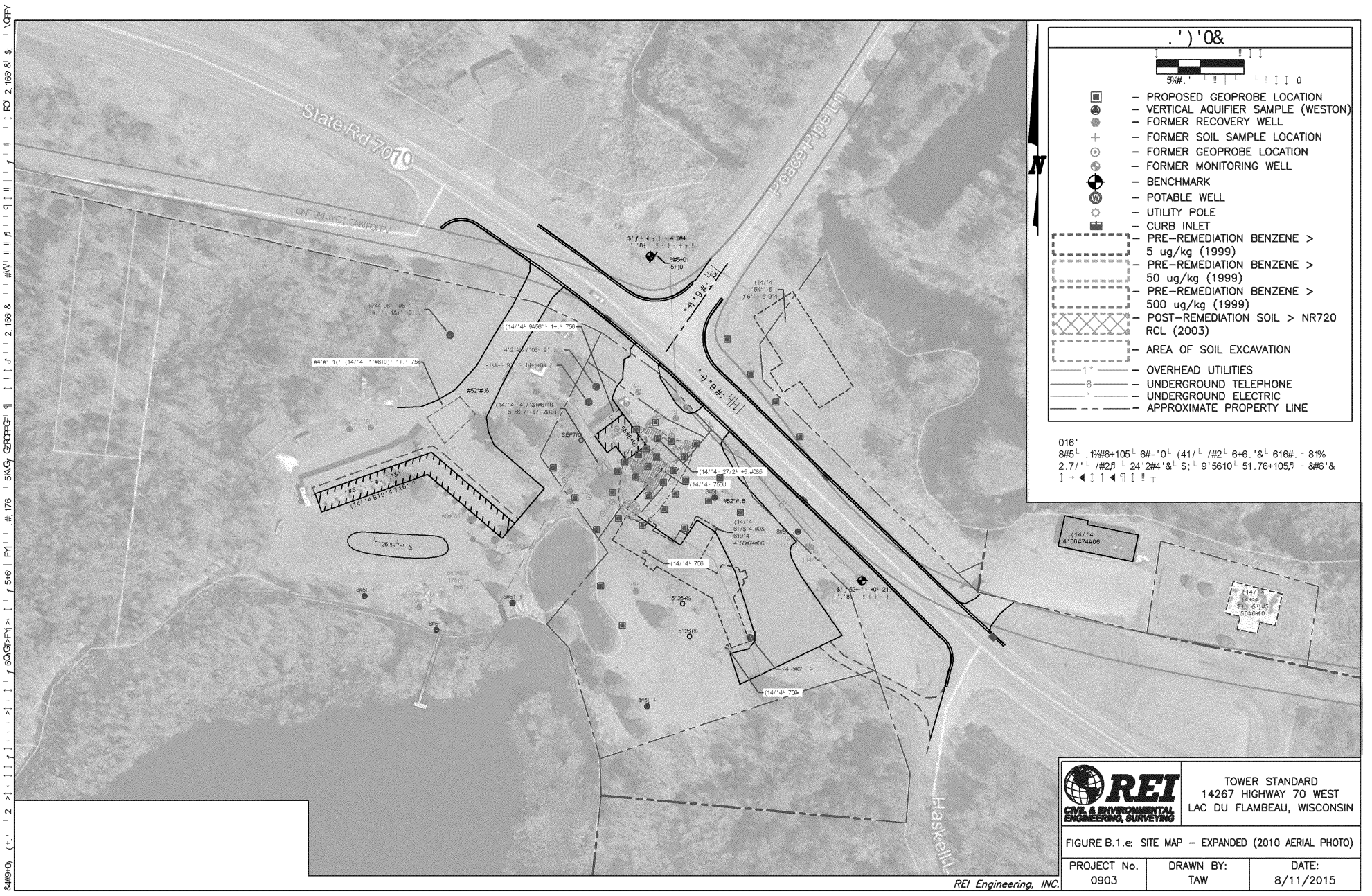
FIGURE B.1.d: SITE MAP (2010 AERIAL PHOTO)
PROJECT No. 0903
DRAWN BY: TAW
DATE: 8/11/2015
REI Engineering, INC.



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TOWER STANDARD
14267 HIGHWAY 70 WEST
LAC DU FLAMBEAU, WISCONSIN

FIGURE B.1.e: SITE MAP – EXPANDED (2010 AERIAL PHOTO)

PROJECT No.	DRAWN BY:	DATE:
0903	TAW	8/11/2015